

A photograph of several hands of different skin tones cupped together, holding a pile of white rice. The hands are arranged in a circular pattern, with the rice in the center. The background is dark and textured.

LOVE. SHARING. COOPERATION.

**THE BILL & MELINDA  
GATES FOUNDATION  
AND  
THE CHINESE ACADEMY OF  
AGRICULTURAL SCIENCES  
COOPERATION**

Together for a Better World

Creating a Healthier  
Fairer World

# CAAS-BMGF COLLABORATIVE RESEARCH PROJECTS

NO.1

Institute of Crop  
Sciences



## GSR FOR THE RESOURCE-POOR OF ASIA AND AFRICA PROJECT

The GSR project is the largest international agricultural science and technology poverty alleviation project led by China's scientific institutions and scientists since the founding of the People's Republic of China. It is funded by China's Ministry of Science and Technology and the BMGF, and has been implemented in three phases (2008–2011, 2012–2015, and 2016–2019). The Chinese government contributed RMB 156 million in domestic funding, while the BMGF invested USD 41.25 million. The project was launched in 2008 and led by Prof. Li Zhikang from the Institute of Crop Science of CAAS. In collaboration with 58 rice research institutes (26 international and 32 domestic), the project employed advanced breeding technologies to cultivate a wide range of high-yield, high-quality, and multi-resistant GSR varieties. These varieties were tested, approved, and promoted in 18 target countries and regions in Africa and Asia, including those along the Belt and Road, significantly contributing to food security in these areas. The project has achieved the following five major outcomes:

First, high-quality Chinese rice varieties and germplasm were shared with African and Asian countries. A total of 5,235 samples of GSR varieties or breeding materials, featuring different combinations of green traits, were distributed and tested in 26 research institutions across 18 target countries. Through years of trials in different countries, numerous high-quality rice varieties suited to different local ecological environments were identified, entering the process of variety approval and promotion.

Second, new high-yield, multi-resistant GSR varieties, adapted to the different ecological environments of the target countries, were efficiently bred. Since the project's launch in 2008, over 4,900 selected chromosome segment substitution lines have been developed, and more than 150 high-yield, multi-resistant GSR lines have entered regional trials in various target countries. Among them, 24 varieties have been approved in countries such as the Philippines, Vietnam, Pakistan, and Indonesia.

Third, GSR varieties developed through the project have been successfully approved and promoted in target countries and regions. A total of 78 varieties have been approved in 18 target countries across Asia and Africa, including 9 African countries around the Sahara Desert, 5 Southeast Asian countries, and 4 South Asian countries.



Institute of Crop  
Sciences

Of these, 52 are conventional rice varieties, and 26 are hybrid rice varieties. These varieties are now being steadily promoted and applied in their respective targeted countries.

Fourth, the promotion of new GSR varieties has brought significant socioeconomic benefits. Reports indicate that GSR varieties cultivated in the Philippines and Bangladesh have increased yields by 0.89 to 1.83 tons per hectare compared to locally grown rice varieties, resulting in an average additional income of USD 230.9 per hectare. Based on these estimates, the cumulative promotion of GSR varieties across 612 hectares in target countries in Africa and Asia has led to an estimated increase in farmers' income by USD 1.4 billion.

Lastly, talent cultivation and technical training have greatly facilitated capacity building in the target countries. A total of 58 graduate students from 15 target countries pursued their master's or doctoral degrees at the Chinese research institutions or the International Rice Research Institute involved in the project. Additionally, nearly 943 technical personnel from 15 countries received advanced training in GSR breeding techniques, with over 3,051 participants trained across different target countries.



Institute of Crop  
Sciences

NO.2

## PROJECT TO HELP WEST AFRICAN COUNTRIES STRENGTHEN RICE SEED SYSTEMS

Based on the GSR for the Resource-Poor of Asia and Africa project, the Institute of Crop Science at CAAS signed a cooperation agreement with the BMGF in September 2021 to launch a project help West African countries strengthen rice seed systems. The project aims to leverage the strengths of both parties and expand available resources to promote the application of Chinese rice research and technology in Africa, thereby supporting Africa's sustainable agricultural transformation.



Institute of Crop  
Sciences

Institute of Plant  
Protection



**ESTABLISHMENT OF EARLY  
WARNING SYSTEM FOR CROP  
PESTS IN CHINA AND EXPERIENCE  
SHARING**

The project produced a comprehensive report titled “Establishment of China’s Early Warning System for Crop Pests and Experience Sharing” in both Chinese and English, along with four sub-reports in both languages. This project marks the first comprehensive and systematic review of China’s efforts in building an early warning system for crop pests, and China’s experiences in developing this system provide valuable guidance and lessons for developing countries in Africa, Asia, and beyond. The project is instrumental in enhancing local capacity for pest and disease control in crops, thereby safeguarding food security. The project was implemented from October 15, 2020, to June 30, 2022.

The implementation of this BMGF-involved project marks the beginning of collaboration between China’s plant protection sector and the BMGF. The project comprehensively and systematically summarizes China’s successful experiences in building an early warning system for crop pests. Sharing China’s achievements in crop pest monitoring and control with developing countries, including those in Africa, is of great significance for China’s agricultural technologies to go out and for supporting Africa in establishing a practical crop pest monitoring and early warning system.

Institute of Plant  
Protection





### Harbin Veterinary Research Institute



## PROJECT ON CONTAGIOUS BOVINE PLEUROPNEUMONIA BEN-1 VACCINE EVALUATION IN AFRICA

Contagious Bovine Pleuropneumonia (CBPP) is an infectious disease caused by *Mycoplasma mycoides* subsp. *mycoides* (Mmm), primarily affecting cattle. If not treated with antibiotics, the disease has a mortality rate of up to 50%. Currently, CBPP remains widespread in 18 countries in Central Africa, causing estimated annual economic losses ranging from USD 80 million to USD 2 billion. In 2013, the BMGF provided a grant of USD 1.82 million to the Harbin Veterinary Research Institute of CAAS for the “Contagious Bovine Pleuropneumonia BEN-1 Vaccine Evaluation in Africa” project. The project aims to introduce China’s vaccine for CBPP to Africa to eliminate the disease, which remains endemic in the region. The project has made the following three key achievements: 1) the trial production of the attenuated vaccine against CBPP was completed in Ethiopia; 2) safety evaluations of the vaccine were carried out, with results showing significantly better performance compared to vaccines currently used in Africa; 3) related efficacy trials were conducted in Zambia in 2016, and the project team’s assessment in September 2017 indicated that the vaccine demonstrated promising efficacy.

### NO.5

## POLICY ADVOCACY PROJECT FOR CHINA-AFRICA MODERN AGRICULTURAL PLANNING

In 2018, the Beijing Summit of the Forum on China-Africa Cooperation (FOCAC) released the “FOCAC Beijing Action Plan (2019-2021),” which clearly stated that “China will work with Africa to jointly formulate and implement a China-Africa Agricultural Modernization Cooperation Plan and Action Plan” (referred to as the “China-Africa Plan”). Therefore, developing the “China-Africa Plan” is a key action to implement agricultural initiatives from the 2018 Beijing Summit of FOCAC and to fulfill China’s commitments under the “FOCAC Beijing Action Plan (2019-2021).” Against this backdrop, the BMGF funded the AII and the CIAR to carry out the “Policy Advocacy Project for China-Africa Modern Agricultural Planning.” The project aims to strengthen the scientific support and policy advocacy for the China-Africa Plan through preliminary scientific research and to ensure effective alignment between the China-Africa Plan and key African strategies. Focused on China-Africa agricultural scientific and technological innovation, the project also aims to provide strategic, practical, and targeted policy recommendations and strong scientific support for the China-Africa Plan by integrating current practices in China-Africa agricultural research cooperation and the transformation and upgrading of agricultural technology demonstration centers.



### Institute of Agricultural Information Center for International Agricultural Research



中国农业科学院

CHINESE ACADEMY OF AGRICULTURAL SCIENCES